

What is claimed is:

1. A system for measuring diffusion of a compound across a membrane comprising:
a first base having first and second opposed surfaces and having a plurality of
5 hollow projections extending outwardly from the first surface, each hollow projection
having a tapered tip with an opening therein and a respective cavity contiguous with the
opening disposed within the projection;
a second base having first and second opposed surfaces, the first surface having a
plurality of recessed tapered openings therein adapted to engage the plurality of hollow
10 projections, each recessed tapered opening being contiguous with a respective cavity that
extends into the second base; and
a membrane contacting the recessed tapered openings and the tips of the hollow
projections, wherein the first base is fastened to the second base by a first fastening means,
and wherein: a) each cavity within a hollow projection extends through the first base and
15 forms an opening at the second surface of the first base; or b) each cavity within the
second base extends through the second base and forms an opening at the second surface
of the second base; or c) each cavity within a hollow projection extends through the first
base and forms an opening at the second surface of the first base, and each cavity within
the second base extends through the second base and forms an opening at the second
20 surface of the second base.
2. The system of claim 1, wherein at least a portion of at least the first or second base
is transparent or translucent.
- 25 3. The system of claim 1, wherein the first fastening means is a removable means.
4. The system of claim 1, wherein each cavity within a hollow projection extends
through the first base and forms an opening at the second surface of the first base.
- 30 5. The system of claim 4, further comprising a first covering means fastened to the
second surface of the second base.

6. The system of claim 1, wherein the cavity in each hollow projection extends into the first base.
7. The system of claim 1, wherein the cavity in each hollow projection extends
5 through the second base and forms an opening at the second major surface of the second base.
8. The system of claim 1, further comprising a cover plate fastened to the second surface of the first base.
- 10 9. The system of claim 8, wherein at least a portion of the cover plate is transparent or translucent.
10. The system of claim 1, wherein the first and second surfaces of at least one of the
15 first and second bases are major surfaces.
11. The system of claim 1, wherein at least one of the first and second bases comprises a plate.
12. The system of claim 1, wherein each tapered tip has a cross-sectional profile that
20 comprises at least one of an arcuate portion or a beveled portion.
13. The system of claim 1, wherein each recessed tapered opening has a cross-sectional profile that comprises at least one of an arcuate portion or a beveled portion.
- 25 14. The system of claim 1, wherein the projections further comprise a body portion having at least one wall.
15. The system of claim 14, wherein the body portion is cylindrical.
- 30 16. The system of claim 1, wherein the membrane comprises a synthetic polymer.

17. The system of claim 1, wherein the membrane comprises animal tissue.
18. The system of claim 1, wherein the membrane comprises skin.
- 5 19. The system of claim 1, further comprising a retaining plate having perforations therein adapted to allow the hollow projections to pass therethrough, wherein the retaining plate is fastened to the second base by a second fastening means, wherein the membrane is disposed between the second base and the retaining plate.
- 10 20. The system of claim 19, wherein the second fastening means is removable.
21. The system of claim 1, wherein each cavity within the second base extends through the second base and forms an opening at the second surface of the second base.
- 15 22. The system of claim 21, further comprising a covering means fastened to the second surface of the second base.
23. The system of claim 21, wherein the cavity in each hollow projection extends through the first base and forms an opening at the second major surface of the first base.
- 20 24. The system of claim 23, further comprising a cover plate fastened to the second surface of the first base.
- 25 25. The system of claim 24, wherein at least a portion of the cover plate is transparent or translucent.
26. The system of claim 21, wherein the first and second surfaces of at least one of the first and second bases are major surfaces.
- 30 27. The system of claim 21, wherein at least one of the first and second bases comprises a plate.

28. The system of claim 21, wherein each tapered tip has a cross-sectional profile that comprises at least one of an arcuate portion or a beveled portion.
29. The system of claim 21, wherein each recessed tapered opening has a cross-sectional profile that comprises at least one of an arcuate portion or a beveled portion.
30. The system of claim 21, wherein the projections further comprise a body portion having at least one wall.
31. The system of claim 30, wherein the body portion is cylindrical.
32. The system of claim 21, wherein the membrane comprises a synthetic polymer.
33. The system of claim 21, wherein the membrane comprises animal tissue.
34. The system of claim 21, wherein the membrane comprises skin.
35. The system of claim 21, further comprising a retaining plate having perforations therein adapted to allow the hollow projections to pass therethrough fastened to the second base by a second fastening means, wherein the membrane is disposed between the second base and the retaining plate.
36. The system of claim 35, wherein the second fastening means is removable.
37. A method of measuring diffusion of a compound through a membrane comprising:
providing a system according to claim 1;
placing a first fluid composition into at least one cavity in the first base;
placing a second fluid composition comprising a compound into at least one cavity in the second base, wherein the cavities in the first and second bases are in fluid communication through the membrane; and
analyzing the compound content of the first fluid composition.

38. A method of measuring diffusion of a compound through a membrane comprising:
providing a system according to claim 4;
placing a first fluid composition into at least one cavity in the first base;
placing a second fluid composition comprising a compound into at least one cavity
5 in the second base, wherein the cavities in the first and second bases are in fluid
communication through the membrane; and
analyzing the compound content of the first fluid composition.
39. A method of measuring diffusion of a compound through a membrane comprising:
10 providing a system according to claim 19;
placing a first fluid composition into at least one cavity in the second base;
placing a second fluid composition comprising a compound into at least one cavity
in the first base, wherein the cavities in the first and second bases are in fluid
communication through the membrane; and
15 analyzing the compound content of the first fluid composition.
40. A method of measuring diffusion of a compound through a membrane comprising:
providing a system according to claim 21;
placing a first fluid composition into at least one cavity in the second base;
20 placing a second fluid composition comprising a compound into at least one cavity
in the first base, wherein the cavities in the first and second bases are in fluid
communication through the membrane; and
analyzing the compound content of the first fluid composition.
41. A method of measuring diffusion of a compound through a membrane comprising:
25 providing a system according to claim 35;
placing a first fluid composition into at least one cavity in the second base;
placing a second fluid composition comprising a compound into at least one cavity
in the first base, wherein the cavities in the first and second bases are in fluid
30 communication through the membrane; and
analyzing the compound content of the first fluid composition.

42. A system, in kit form, for holding a membrane comprising:
a first base having first and second opposed surfaces and having a plurality of hollow projections extending outwardly from the first surface, each hollow projection having a tapered tip with an opening therein and a respective cavity contiguous with the opening disposed within the projection;
a second base having first and second opposed surfaces, the first surface having a plurality of recessed tapered openings therein adapted to engage the plurality of hollow projections, each recessed tapered opening being contiguous with a respective cavity that extends into the second base; and
means for fastening the first base to the second base wherein: a) each cavity within a hollow projection extends through the first base and forms an opening at the second surface of the first base; or b) each cavity within the second base extends through the second base and forms an opening at the second surface of the second base; or c) each cavity within a hollow projection extends through the first base and forms an opening at the second surface of the first base, and each cavity within the second base extends through the second base and forms an opening at the second surface of the second base.
43. The system of claim 42, wherein each cavity within a hollow projection extends through the first base and forms an opening at the second surface of the first base.
44. The system of claim 43, further comprising:
a retaining plate having perforations therein adapted to allow the hollow projections to pass therethrough; and
means for fastening the retaining plate to the second base.
45. The system of claim 42, wherein each cavity within the second base extends through the second base and forms an opening at the second surface of the second base.
46. The system of claim 45, further comprising:
a retaining plate having perforations therein adapted to allow the hollow projections to pass therethrough; and
means for fastening the retaining plate to the second base.